SEMI-YEARLY REPORT

(for July - December 1999)

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Enhanced Land cover and Land Cover Change products from MODIS
Algorithm
Development and Post Launch Studies

by

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1. At-launch Land Cover Product.

a. Task Objectives:

The principal objective of this task is to supply a validated at-
launch land cover product based on the AVHRR at a resolution of 1
km.

b. Task Progress:

We successfully generated a 1 km land cover product to be included
with EDC's DISCover product as the MODIS at-launch product.

This product conforms to MOD12 file specifications as much as
possible and contains both the UMD and EDC land cover products. It
is tiled and gridded in the integerized sinusoidal projection and
possibly the Goode's Homolosine projection as well.

A final version of the UMD 1km land cover map was completed in March
1998. The meta-data describing the quality of both the EDC 1 km
product and our own have been prepared. Validation of our land cover
product is being carried out.

A final version of the coding for the output of the 1km land cover
product has been delivered to SDST for use as simulated data.

A paper describing the UMD 1km land cover classification is in press of a special issue of the International Journal of Remote Sensing (Hansen, DeFries, Townshend, Sohlberg, Global Land Cover Classification at 1km Spatial Resolution Using A Supervised Decision Tree Approach - IJRS special Issue).

In response to NASA headquarters' request, we have generated a global tree cover poster describing the percent coverage of forest, needleleaf vs broadleaf forest and evergreen vs coniferous forest within each 1km pixel of the world. The poster has been delivered to several federal government agents and the White House.

A grand new version of the Algorithm Theoretical Basis Document (ATBD) of the 1km land cover classification product has been created and published on NASA's ATBD web site.

Generation of the version 3.0 of the 1km land cover classification product is in progress. This version distinguishes small grain crops and broadleaf crops and will have several questions addressed. This distinction is needed by several members of the MODIS science team for creating their own products.

c. Anticipated Activities During the Next Semi-year:

The version 3.0 of the 1km land cover classification product will be produced and delivered to SDST and relevant MODLAND science team members.

2. Land cover change indicator product.

a) Task objectives

i) Generation of test data sets.

ii) Production and testing of the at-launch change detection algorithm.

iii) Production and testing of post-launch change detection algorithm.

b) Task progress

i) We are continuing to refine the test data sets and the algorithms for identifying land cover change.

ii) More than three papers about the MODIS at-launch algorithms of land cover change detection have been published. A grand new version of the Algorithm Theoretical Basis Document (ATBD) of the land cover change indicator product has been created and published on NASA's ATBD web site (details are in the report for the January-June 1999 semi-year).

During the second semi-year of 1999, testing of the computer code of the land cove change indicator product with the test data sets and the LUTs required for the at-launch change detection algorithms has be carried out. Part of the testing results is sent to Goddard DAAC for use in their web site as samples of the product. It is found that the LUTs based on the AVHRR data will likely require modification when actual MODIS data are available.

As a new contribution of the UMD MODIS team, processing of 250m resolution MODIS data (band 1 and 2) higher than Level 2 will be carried out in UMD campus. The required computer codes and networking, storage hardware have been made ready.

iii) The automation procedure for generating the LUTs of the change detection algorithms is examined to ensure that it will work for generating the LUTs with future actual MODIS data.

c) Anticipated Activities during the Next Semi-year

i) No more actions on test data generation are planned.

ii) Findings from the testing of the computer code of the MODIS at-launch land cover change indicator product with the test data will be detailed in a paper for publication.

A first light product of MODIS 250m data will be generated with the first set of actual MODIS data.

iii) We continue to review and inter compare land cover change detection approaches in anticipation of post launch algorithm updates and refinements.

3. Continuous fields of land cover properties

a) Task objectives

Generation of continuous fields of land cover attributes

b) Task progress

A global tree cover poster describing the percent coverage of forest, needleleaf vs broadleaf forest and evergreen vs coniferous forest within each 1km pixel of the world was generated and has been delivered to several federal government agents and the White House. Several papers describing the global vegetation continuous fields have been already published (see last report for details). A grand new version of the Algorithm Theoretical Basis Document (ATBD) of the vegetation continuous fields product has been created and published on NASA's ATBD web site.

The computer code for the MODIS Vegetation Continuous Fields post-launch product is already written and still in the debugging stage.

Field measurements and survey for validating the prototype product of Vegetation Continuous Fields have been carried out in a local park where various land cover types exists and airphotos are available.

c) Anticipated Activities during the Next Semi-year

We plan to assess the accuracy of the prototype AVHRR products for continuous fields based on comparisons with other global and regional land cover products. In addition, we plan to develop code for deriving continuous fields from MODIS data as a post-launch product.

Field work will be carried out in Southern Africa to validate the continuous fields products and refine the algorithms.

The computer code for the MODIS Vegetation Continuous fields post-launch product will be delivered after a successful debugging stage.